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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/009,021	03/19/2002	Tadashi Ishibashi	9793822-0158	6238

7590 12/13/2004

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EXAMINER
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THOMPSON, CAMIE S

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 12/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/009,021	<b>Applicant(s)</b> ISHIBASHI ET AL. 	
	<b>Examiner</b> Camie S Thompson	<b>Art Unit</b> 1774	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on Amendment filed on September 28, 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6, 9-18, 21-26, 29-38, 41-46, 49-53 and 56-61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 9-18, 21-26, 29-38, 41-46, 49-53 and 56-61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>12/5/01 &amp; 8/9/04</u>  | 6) <input type="checkbox"/> Other: _____                                    |

### DETAILED ACTION

1. Applicant's amendment and accompanying remarks filed September 28, 2004 have been acknowledged.
2. Upon further consideration, the examiner realizes that all claims read on the elected ultimate species 17-1. Therefore, all claims are examined.
3. Examiner acknowledges amended claims 9-18, 29-38, 49-53.
4. Examiner acknowledges newly added claims 56-61.
5. Examiner acknowledges cancelled claims 7-8, 19-20, 27-28, 39-40, 47-48 and 54-55.
6. The rejection of claims 9-20, 29-40 and 49-55 under 35 U.S.C. 102(e) as being anticipated by Tadashi et al., U.S. Patent Number 6,265,088 is withdrawn in view of the amendment to inventorship. U.S. Patent Number 6,265,088 is no longer available as prior art.
7. The obviousness-type double patenting rejection of claims 9-20, 29-40 and 49-55 as being unpatentable over U.S. Patent Number 6,525,212 is withdrawn due to applicant's argument.
8. In view of the papers filed September 28, 2004, the inventorship in this nonprovisional application has been changed by the deletion of Naoyuki Ueda.

The application will be forwarded to the Office of Initial Patent Examination (OIPE) for issuance of a corrected filing receipt, and correction of Office records to reflect the inventorship as corrected.

Although the amendment to inventorship is granted because it meets the requirements of 37 CFR 1.48 (b), it is not clear how the invention of claim 7, for example, differs from the invention of claim 1.

*Claim Objections*

9. Claims 1-2, 15-16, 21-22, 35, 41, 49, 58 and 61 are objected to because of the following informalities:

Claim 1: Delete the extraneous periods after "formula [1] on page 1, after the term "different" at the end of page 1 and after "(10)" in the second line of page 2.

Claim 2: Delete the extraneous period after "(9)" at the end of page 2.

Claim 15: The claim contains superfluous language. The electron transfer layer is at least one layer in the laminate structure that has an organic layer composed of a hole transfer layer and an electron transfer layer.

Claim 16: The claim contains superfluous language. The hole transfer layer is at least one layer in the laminate structure that has an organic layer composed of a hole transfer layer and an electron transfer layer.

Claim 21: Delete the extraneous periods after the term "mixture" at the end of page 9, after the term "different" in the third to the last line on page 9 and after "(10)" at end of page 9.

Claim 22: Delete the extraneous period after "(9)" on page 11.

Claim 35: The term "the" is misspelled in the phrase "laminate structure being the electron transfer layer" in the last line of the claim. The claim contains superfluous language. The electron transfer layer is at least one layer in the laminate structure that has an organic layer composed of a hole transfer layer and an electron transfer layer.

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Claim 36: The claim contains superfluous language. The hole transfer layer is at least one layer in the laminate structure that has an organic layer composed of a hole transfer layer and an electron transfer layer.

Claim 41: The term “an” is misspelled in the phrase “an aminostyryl compound represented by..” in the fourth line of the claim. Delete the extraneous period after the term “different” in line 9 of the claim text.

Claim 42: Delete the extraneous period after “(9)” in line 4 of the claim text.

Claim 49: The term “distyryl” is misspelled in the second to the last line of the claim.

Claim 58: The term “porphyrin” is misspelled.

Claim 61: The term “porphyrin” is misspelled.

Appropriate correction is required.

10. Applicant is advised that should claim 15 be found allowable, claim 16 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

11. Applicant is advised that should claim 35 be found allowable, claim 36 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

***Claim Rejections - 35 USC § 112***

12. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

13. Claims 9-18, 21-26, 29-38, 41-46, 49-53 and 56-61 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 9, 29 and 49, and claims dependent therefrom, are rendered indefinite because it is unclear if the Markush group is limited to the list or to all the formulae shown.

Claims 17-18 and 37-38 are rendered indefinite because nm is not a unit of frequency.

Claims 21, 25 and 4, and claims dependent therefrom, are rendered indefinite because the layer construction is not clearly defined.

***Claim Rejections - 35 USC § 102***

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

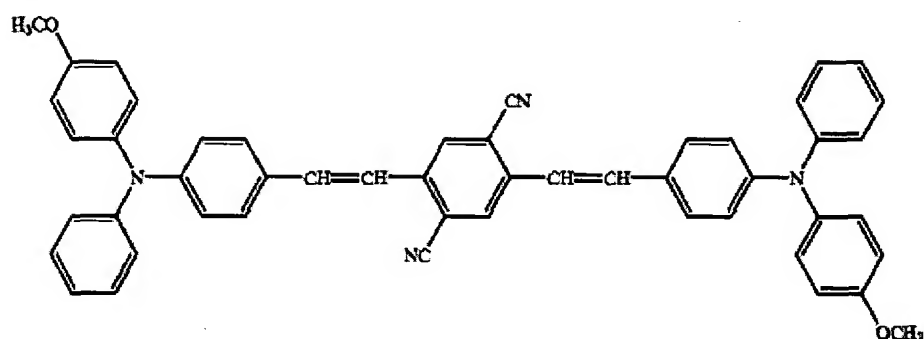
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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15. Claims 1-2, 9 and 56-57 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0954205.

The European reference discloses an organic electroluminescent device wherein at least one organic light emitting material is disposed between an anode and a cathode (see Figure 1 and paragraphs 0021-0026). Additionally, the reference discloses that the electroluminescent layer can comprise one or more materials such as aromatic amines, pyrazolines and metal complex compounds with aluminum as per instant claims 1 and 2 (see paragraphs 0029-0031). Examples 2, 3, 5 and 6 of the reference disclose the electroluminescent layer as containing



and a hole

transporting material such as  $\alpha$ -NPD (Example 2) or Alq<sub>3</sub> (Example 3) as per instant claims 56 and 57. The distyryl compound of the European reference also meets the limitation of being a hole transport or electron transport material.

16. Claims 1-6, 9-13, 21-27, 29-33, 35-36, 41-46, 49-53 and 59-60 are rejected under 35 U.S.C. 102(e) as being anticipated by Ichimura et al., U.S. Patent Number 6,525,212.

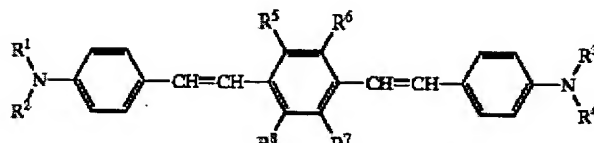
The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e).

This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR

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1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Ichimura discloses an organic electroluminescence device that comprises an organic layer having a luminescent region and is provided between an anode and a cathode. The organic layer comprises at least one distyryl compound such as



as per instant claims 1-2, 9, 29, 41 and 49 (see abstract; column 2, lines 10-68). The reference



discloses that Ar<sup>1</sup>, Ar<sup>2</sup>, Ar<sup>3</sup> and Ar<sup>4</sup> can be wherein R<sup>60</sup> represents an  
alkyl group having from 1 to 4 carbon atoms. The Ichimura reference reads on molecule (15)-1 of the instant claims. Additionally, the reference discloses that the organic layer comprises an electron transport layer, a hole transport layer and a luminescent layer (see 76, lines 35-59). Column 74, lines 61-68 of the reference discloses that the distyryl compounds have both electron transportability and hole transportability and can be used in the luminescent layer, electron transport layer or hole transport layer as per the instant claims. Additionally, it is disclosed in the reference in column 74 that the electron transport, hole transport and luminescent layers can comprise a mixture of a distyryl compound and a hole or electron transport material such as an aromatic amine ( $\alpha$ -NPD) or a pyrazoline. Figures 45-47 of the reference disclose that the device

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is a multilayer structure as per the instant claims. The reference discloses a hole blocking layer or an exciton-generating layer in order to improve the luminescent efficiency as per the instant claims (see column 77, lines 1-9).

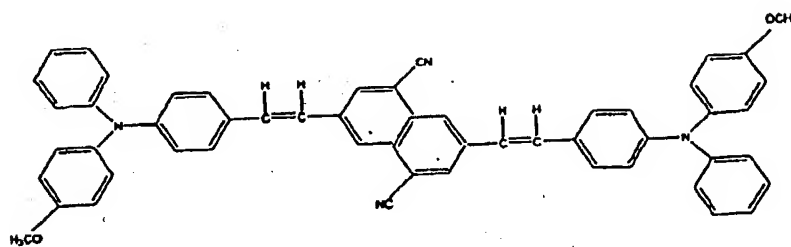
***Claim Rejections - 35 USC § 103***

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 1-6, 9-13, 21-27, 29-33, 35-36, 41-46, 49-53 and 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0967834.

The reference discloses an organic electroluminescent device comprising an organic layer having a luminescent region that is disposed between the anode and the cathode. The reference also discloses that the device has a built-up structure of a hole transport layer, an electron transport layer and a luminescent layer each consists of a distyryl compound such as



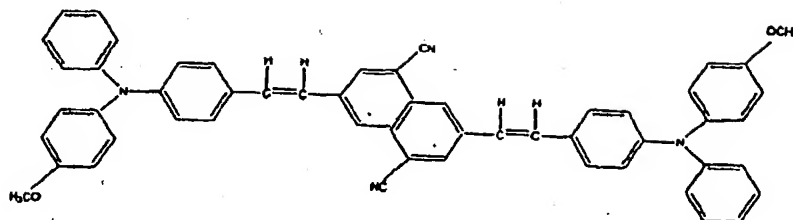
(see paragraph 0038). The distyryl compound of the European reference is a position isomer of compound (17)-1 of the present invention. Compounds that are position isomers are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). Therefore, it would have been obvious to one of ordinary skill in the art to use the distyryl compound (4)-1 of the patented reference in the device of the instant invention since the compounds are expected to possess similar properties.

Additionally, it is disclosed in paragraph 0038 of the reference that the hole transport layer, electron transport layer and the luminescent layer may be formed with a distyryl compound and another type of hole or electron transport materials such as  $\alpha$ -naphthylphenyldiamine (NPD) or pyrazoline as per the instant claims. Paragraph 0039 of the reference discloses a hole blocking layer for controlling the transport of holes or electrons as per the instant claims. The distyryl compound of the European reference also meets the limitation of being a hole transport or electron transport material (see paragraph 0028).

19. Claims 9, 14, 17-18, 29, 34, 37-38, 58 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 0967834 in view of Mori et al., U.S. Patent Number 5,281,489.

The reference discloses an organic electroluminescent device comprising an organic layer having a luminescent region that is disposed between the anode and the cathode. The reference also discloses that the device has a built-up structure of a hole transport layer, an electron transport layer and a luminescent layer each consists of a distyryl compound such as

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(see paragraph 0038). The distyryl compound of the patented reference is a position isomer of compound (17)-1 of the present invention. Compounds that are position isomers are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). Therefore, it would have been obvious to one of ordinary skill in the art to use the distyryl compound (4)-1 of the patented reference in the device of the instant invention since the compounds are expected to possess similar properties.

Additionally, it is disclosed in paragraph 0038 of the reference that the hole transport layer, electron transport layer and the luminescent layer may be formed with a distyryl compound and another type of hole or electron transport materials such as  $\alpha$ -naphthylphenyldiamine (NPD) or pyrazoline as per the instant claims. Paragraph 0039 of the reference discloses a hole blocking layer for controlling the transport of holes or electrons as per the instant claims. The distyryl compound of the European reference also meets the limitation of being a hole transport or electron transport material (see paragraph 0028). In paragraph 0039 of the reference, it is disclosed that a fluorescent material may be contained in the luminescent layer and both the hole and electron transport layers. The European reference does not specifically disclose the fluorescent material. Mori teaches an organic electroluminescent device that comprises an

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anode, a cathode and an organic luminescent layer disposed therebetween. Also, Mori teaches that the organic luminescent layer comprises a mixture of a fluorescent luminescent agent, at least one hole moving and donating and at least one electron moving and donating agent.

Column 40, lines 15-68 of the reference disclose the use of Rhodamine B and Nile red as the luminescent agents. The addition of a dye increases the luminescent efficiency as shown by the European reference in paragraph 0039. Therefore, it would have been obvious to one of ordinary skill in the art to have a dye such as Nile red that emits red light in the electron transport, hole transport and luminescent layer in order obtain a device that has great luminescent performance.

### ***Double Patenting***

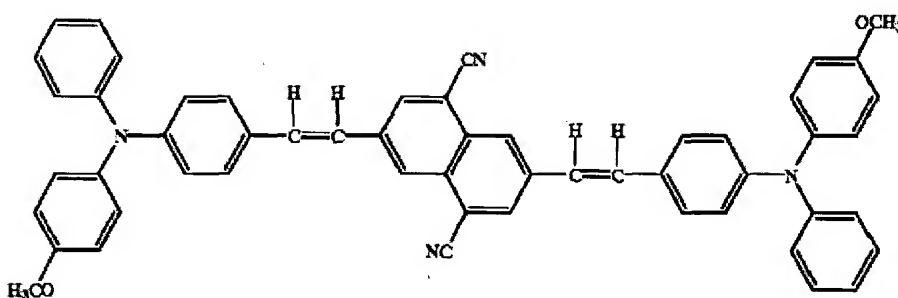
20. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

21. Claims 1-6, 9-13 and 56 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-8 of U.S. Patent No. 6,265,088.

Although the conflicting claims are not identical, they are not patentably distinct from each other because both the instant claims and the patent disclose an organic electroluminescent device comprising an anode and a cathode, an organic layer disposed between the anode and the cathode wherein the organic layer comprises an organic luminescent material comprising at least one distyryl compound. In the case of the instant invention and the patented claims, the distyryl compounds are aromatic amines. The patented reference recites a distyryl compound with the following structure



. The distyryl

compound of the patented reference is a position isomer of compound (17)-1 of the present invention. Compounds that are position isomers are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). Therefore, it would have been obvious

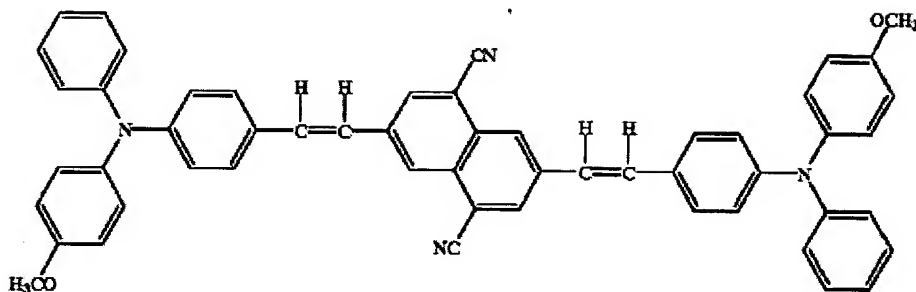
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to one of ordinary skill in the art to use the distyryl compound (4)-1 of the patented reference in the device of the instant invention since the compounds are expected to possess similar properties.

The reference does not specifically disclose that the organic layer also comprises at least one compound selected from the group consisting of hole transport materials, electron transport materials and dopants for red light emission. The reference does recite that at least one distyryl compound is used in the organic layer. Therefore, the reference reads that more than one distyryl compound can be used in the organic layer. The distyryl compounds of the patented reference can be used as hole transport or electron transport materials. The mixture of distyryl compounds in the organic layer provides a highly reliable red light emission. Therefore, it would have been obvious to one of ordinary skill in the art to have more than one distyryl compound in the organic layer in order to have a electroluminescent device that produces high red light emission.

22. Claims 9 and 14-16 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1-8 of U.S. Patent No. 6,265,088 in view of Mori et al., U.S. Patent Number 5,281,489.

Although the conflicting claims are not identical, they are not patentably distinct from each other because both the instant claims and the patent disclose an organic electroluminescent device comprising an anode and a cathode, an organic layer disposed between the anode and the cathode wherein the organic layer comprises an organic luminescent material comprising at least one distyryl compound. In the case of the instant invention and the patented claims, the distyryl compounds are aromatic amines. The patented reference recites a distyryl compound with the following structure



The distyryl

compound of the patented reference is a position isomer of compound (17)-1 of the present invention. Compounds that are position isomers are generally of sufficiently close structural similarity that there is a presumed expectation that such compounds possess similar properties. *In re Wilder*, 563 F.2d 457, 195 USPQ 426 (CCPA 1977). Therefore, it would have been obvious to one of ordinary skill in the art to use the distyryl compound (4)-1 of the patented reference in the device of the instant invention since the compounds are expected to possess similar properties.

The reference does not specifically disclose that the organic layer also comprises at least one compound selected from the group consisting of hole transport materials, electron transport materials and dopants for red light emission. The reference does recite that at least one distyryl compound is used in the organic layer. Therefore, the reference reads that more than one distyryl compound can be used in the organic layer. The distyryl compounds of the patented reference can be used as hole transport or electron transport materials. The mixture of distyryl compounds in the organic layer provides a highly reliable red light emission. Therefore, it would have been obvious to one of ordinary skill in the art to have more than one distyryl compound in the organic layer in order to have a electroluminescent device that produces high red light emission.

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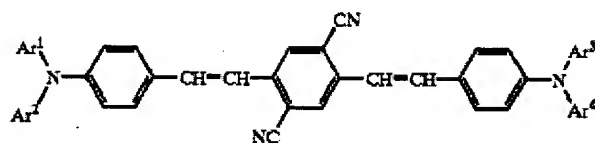
It is not recited in the Tadashi patented reference that a dye is used in the organic layer as per instant claim 14. Mori teaches an organic electroluminescent device that comprises an anode, a cathode and an organic luminescent layer disposed therebetween. Also, Mori teaches that the organic luminescent layer comprises a mixture of a fluorescent luminescent agent, at least one hole moving and donating and at least one electron moving and donating agent. Column 40, lines 15-68 of the reference disclose the use of Rhodamine B and Nile red as the luminescent agents. The addition of a dye increases the luminescent efficiency of an electroluminescent device. Therefore, it would have been obvious to one of ordinary skill in the art to have a dye such as Nile red that emits red light in the electron transport, hole transport and luminescent layer in order obtain a device that has great luminescent performance.

### *Response to Arguments*

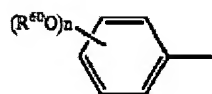
Applicant's arguments filed September 28, 2004 have been fully considered but they are not persuasive. Applicant argues that the organic layer in the electroluminescent element of the instant invention comprises a distyryl compound and a material that has hole transport capabilities, electron transport capabilities or is a dopant. The distyryl compounds of the 6,265,088 reference meets the limitation of being a hole transport or electron transport material. Instant claim 9 does not necessarily require two compounds since (i) meets the limitations of (ii). The patented reference recites at least one distyryl compound. There can be more than one distyryl compound used in the organic layer. The distyryl compounds of the patented reference '088 have hole transport and electron transport capabilities. The instant invention claims an electroluminescent element comprising an anode, cathode and an organic layer that comprises a

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distyryl compound and a material that has hole transport capabilities, electron transport capabilities or is a dopant. The reference recites an electroluminescent device with the same components as does applicant for instant claims 9-13 and 15-16. Additionally, applicant argues that the removal of molecules (15)-2 to (15-8) and (15)-11 to (15-12) renders the rejection of the claims under the Ichimura reference moot. The Ichimura reference discloses



wherein Ar<sup>1</sup>, Ar<sup>2</sup>, Ar<sup>3</sup> and Ar<sup>4</sup> can be



wherein R<sup>60</sup> represents an alkyl group having from 1 to 4 carbon atoms.

The Ichimura reference reads on molecule (15)-1 of the instant claims.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (571) 272-1530. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rena L. Dye, can be reached at (571) 272-3186. The fax phone number for the Group is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Marie R. Yamnitzky*

MARIE YAMNITZKY  
PRIMARY EXAMINER

*1774*

*12/10/2004*